

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Withdrawn) A quartz crystal substrate used to form a twin in a quartz crystal by the hot pressing method, this quartz crystal substrate being characterized in that this substrate has, on one side, a step structure in which protruding parts that serve as pressure receiving surfaces for receiving the pressure of the pressing apparatus are formed, and this step structure is formed by a combination of a lithographic exposure technique and dry etching.

2. (Cancelled)

3. (Currently amended) A pressing apparatus for forming a twin in a quartz crystal by the hot pressing method, comprising:

a lower block consisting of a lower heater block and a lower

pressing plate;

an upper block consisting of an upper heater block and an upper pressing plate; and

a bearing block connecting to the upper heater block of the upper block,

wherein the lower block and the upper block function to hold the quartz crystal,

the lower pressing plate and the upper pressing plate are constructed from a different material from the lower heater block and the upper heater block,

a surface disposed so that it contacts with the quartz crystal during the hot pressing, on either the lower pressing plate or the upper pressing plate; [[has]] said surface having a step structure with a plurality of periodic protruding parts satisfying quasi-phase matching condition for the quartz crystal and having the period from several microns to several tens of microns,

the upper heater block has a protruding part which is worked into a convex surface with a radius of  $R_1$ ,

the bearing block has a recessed part with is worked into a concave surface with a radius of  $R_2$  ( $R_2 > R_1$ ), and

the protruding part and the recessed part are engaged to generate a swinging mechanism.

4. (Cancelled)

5. (Previously presented) The pressing apparatus according to claim 3, wherein the upper heater block and the lower heater block comprise a plurality of heaters, respectively.

6. (Previously presented) The pressing apparatus according to Claim 3 which is characterized in that air pressure alone is used to generate the pressing force.

7. (Canceled)

8. (Withdrawn) A method for producing a step structure on a surface of a quartz crystal, the method comprising steps of;  
applying a lithographic exposure technique to the quartz, crystal; and  
dry etching the quartz crystal.

9. **(Withdrawn)** The method according to Claim 8, wherein the step of applying the lithographic exposure technique further includes the steps of;

forming a Cr film on the surface of the quartz crystal;

coating a resist on the Cr film and exposing a portion except, a predetermined portion; and

removing the exposed resist and Cr film to leave the Cr film and resist on the predetermined portion; and

wherein the step of dry-etching comprises dry-etching the surface using the Cr film and resist remaining on the predetermined portion, as a mask.